N-Channel Enhancement-Mode Vertical DMOS FETs

Ordering Information

BV_{DSS} / BV_{DGS}	$R_{DS(ON)}$ (max)	$I_{D(ON)}$ (min)	Order Number / Package
			TO-39
60V	3.0Ω	1.5A	2N6660
90V	4.0Ω	1.5A	2N6661

High Reliability Devices

See pages 5-4 and 5-5 for MILITARY STANDARD Process Flows and Ordering Information.

Features

- ❏ Free from secondary breakdown
- ❏ Low power drive requirement
- ❏ Ease of paralleling
- ❏ Low C_{ISS} and fast switching speeds
- ❏ Excellent thermal stability
- ❏ Integral Source-Drain diode
- ❏ High input impedance and high gain
- ❏ Complementary N- and P-channel devices

Applications

- ❏ Motor controls
- ❏ Converters
- ❏ Amplifiers
- ❏ Switches
- ❏ Power supply circuits
- ❏ Drivers (relays, hammers, solenoids, lamps, memories, displays, bipolar transistors, etc.)

Absolute Maximum Ratings

Drain-to-Source Voltage	BV_{DSS}
Drain-to-Gate Voltage	BV_{DGS}
Gate-to-Source Voltage	± 20V
Operating and Storage Temperature	-55°C to +150°C
Soldering Temperature*	300°C

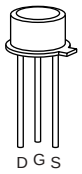
* Distance of 1.6 mm from case for 10 seconds.

Advanced DMOS Technology

These enhancement-mode (normally-off) transistors utilize a vertical DMOS structure and Supertex's well-proven silicon-gate manufacturing process. This combination produces devices with the power handling capabilities of bipolar transistors and with the high input impedance and positive temperature coefficient inherent in MOS devices. Characteristic of all MOS structures, these devices are free from thermal runaway and thermally-induced secondary breakdown.

Supertex's vertical DMOS FETs are ideally suited to a wide range of switching and amplifying applications where high breakdown voltage, high input impedance, low input capacitance, and fast switching speeds are desired.

Package Option



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Case: DRAIN

Note: See Package Outline section for dimensions.

Thermal Characteristics

Package	I_D (continuous)*	I_D (pulsed)	Power Dissipation @ T_C = 25°C	θ_{jc} °C/W	θ_{ja} °C/W	I_{DR}*	I_{DRM}
2N6660	410mA	3A	6.25W	20	125	410mA	3.0A
2N6661	350mA	3A	6.25W	20	125	350mA	3.0A

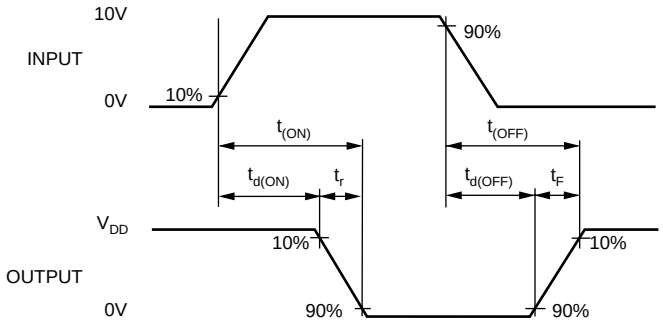
* I_D (continuous) is limited by max rated T_j.

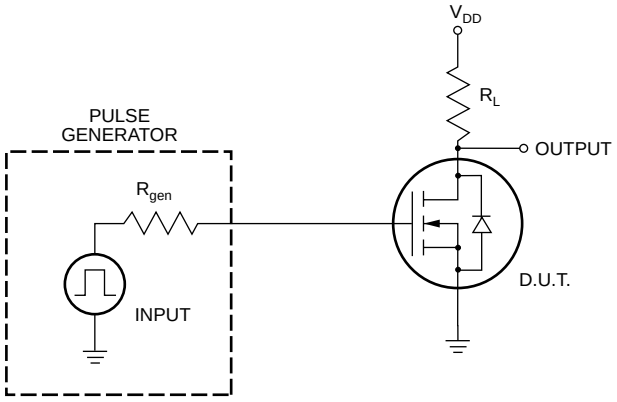
Electrical Characteristics (@ 25°C unless otherwise specified)

Symbol	Parameter		Min	Typ	Max	Unit	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	2N6660	60			V	V_{GS} = 0V, I_D = 10μA
		2N6661	90				
$V_{GS(th)}$	Gate Threshold Voltage		0.8		2.0	V	V_{GS} = V_{DS}, I_D =1mA
$\Delta V_{GS(th)}$	Change in $V_{GS(th)}$ with Temperature			-3.8	-5.5	mV/°C	V_{GS} = V_{DS}, I_D =1mA
I_{GSS}	Gate Body Leakage				100	nA	V_{GS} = ± 20V, V_{DS} = 0V
I_{DSS}	Zero Gate Voltage Drain Current				10	μA	V_{GS} = 0V, V_{DS} = Max Rating
					500		V_{GS} = 0V, V_{DS} = 0.8 Max Rating, T_A = 125°C
$I_{D(ON)}$	ON-State Drain Current		1.5			A	V_{GS} = 10V, V_{DS} = 10V
$R_{DS(ON)}$	Static Drain-to-Source ON-State Resistance	All			5.0	Ω	V_{GS}= 5V, I_D = 0.3A
		2N6660			3.0		V_{GS} = 10V, I_D = 1A
		2N6661			4.0		V_{GS} = 10V, I_D = 1A
G_{FS}	Forward Transconductance		170			m℧	V_{DS} = 25V, I_D = 0.5A
C_{ISS}	Input Capacitance				50	pF	V_{GS} = 0V, V_{DS} = 24V f = 1 MHz
C_{OSS}	Common Source Output Capacitance				40		
C_{RSS}	Reverse Transfer Capacitance				10		
$t_{(ON)}$	Turn-ON Time				10	ns	V_{DD} = 25V, I_D = 1A, R_{GEN} = 25Ω
$t_{(OFF)}$	Turn-OFF Time				10		
V_{SD}	Diode Forward Voltage Drop			1.2		V	V_{GS} = 0V, I_{SD} = 1A
t_{rr}	Reverse Recovery Time			350		ns	V_{GS} = 0V, I_{SD} = 1A

Notes:
1: All D.C. parameters 100% tested at 25°C unless otherwise stated. (Pulse test: 300μs pulse, 2% duty cycle.)
2: All A.C. parameters sample tested.

Switching Waveforms and Test Circuit





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